J. A. HOWELL.

COMBINED BEACH WAGON AND SURF BOAT.

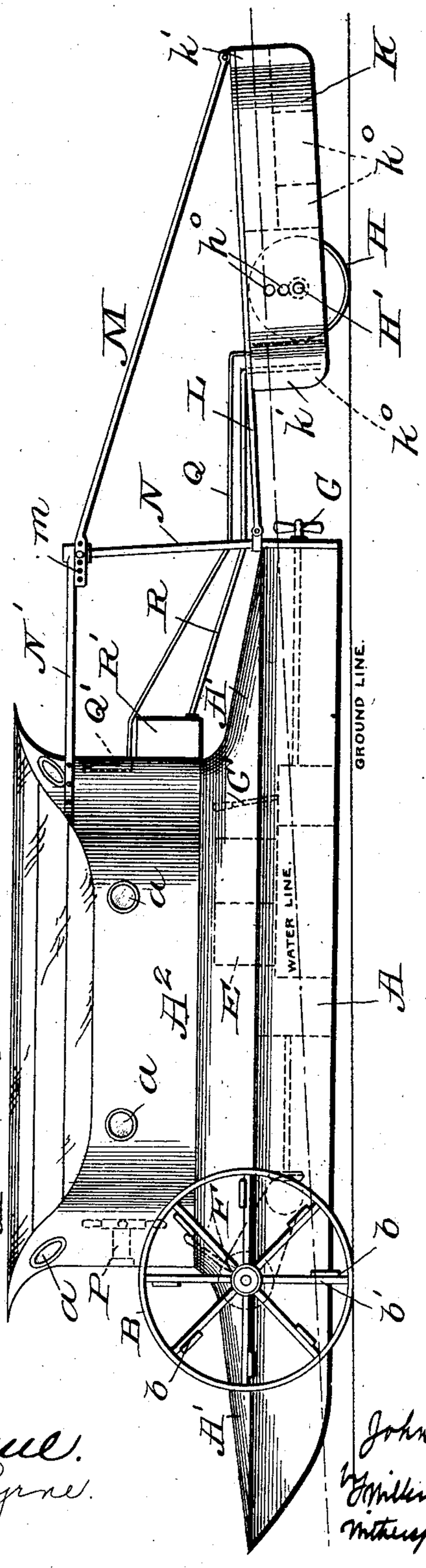
APPLICATION FILED DEC. 8, 1908.

992,775.

Patented May 23, 1911

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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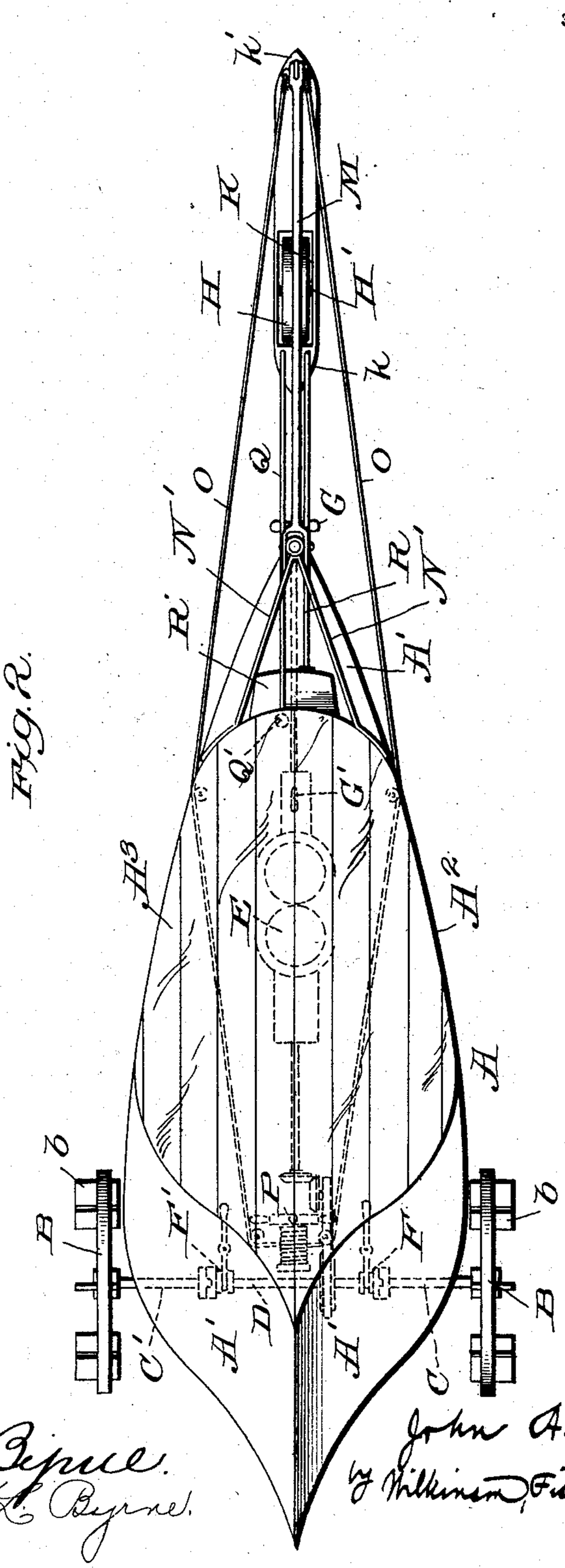
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

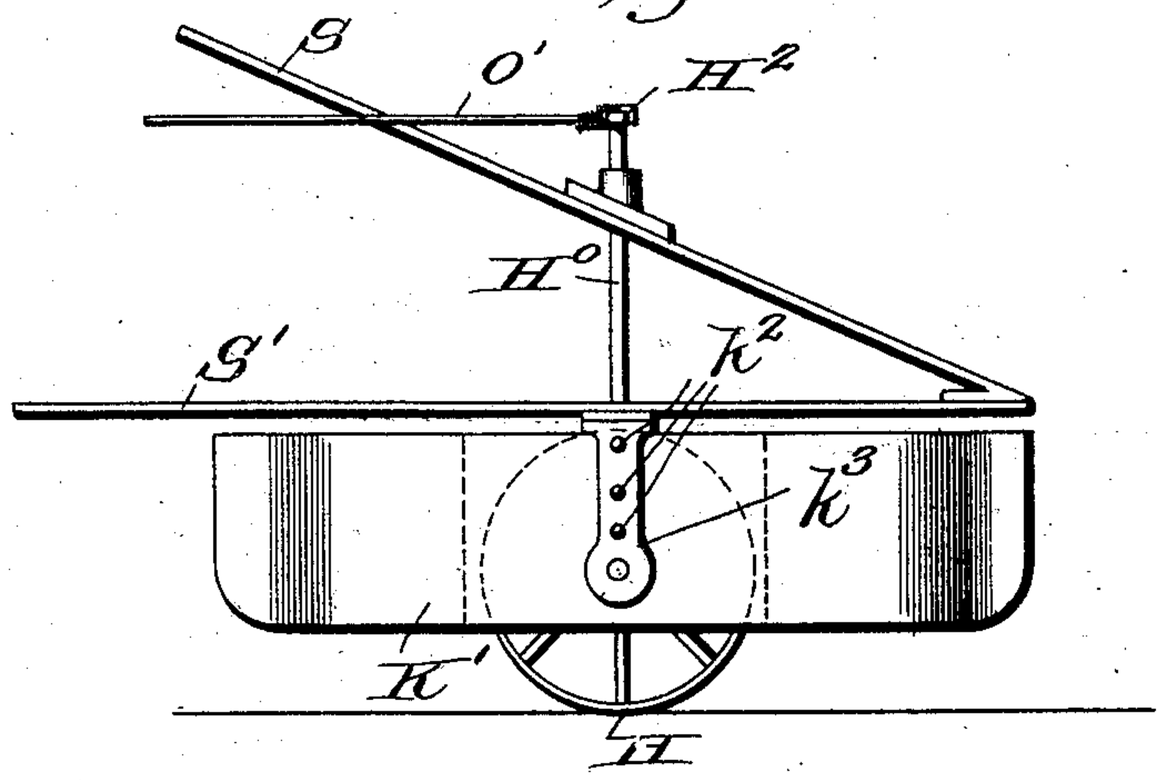


Fig. 4.

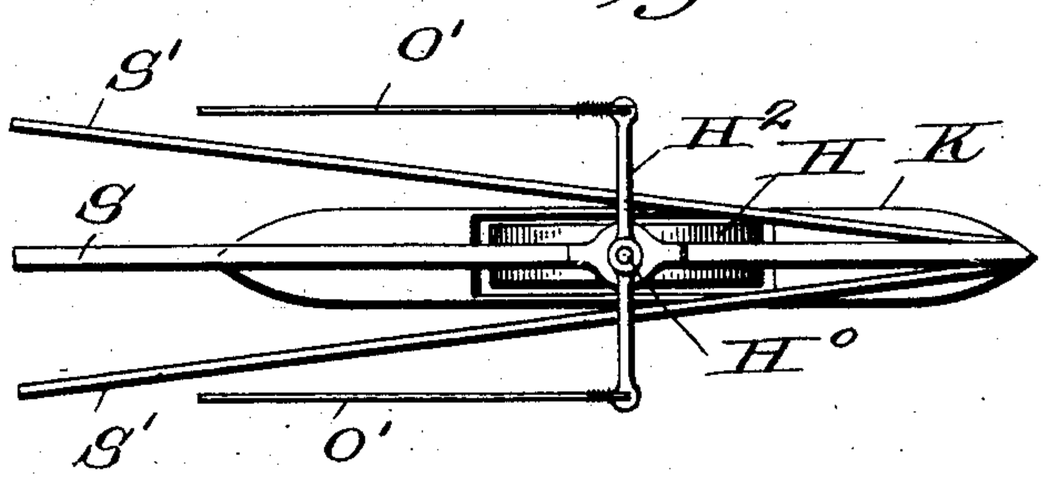
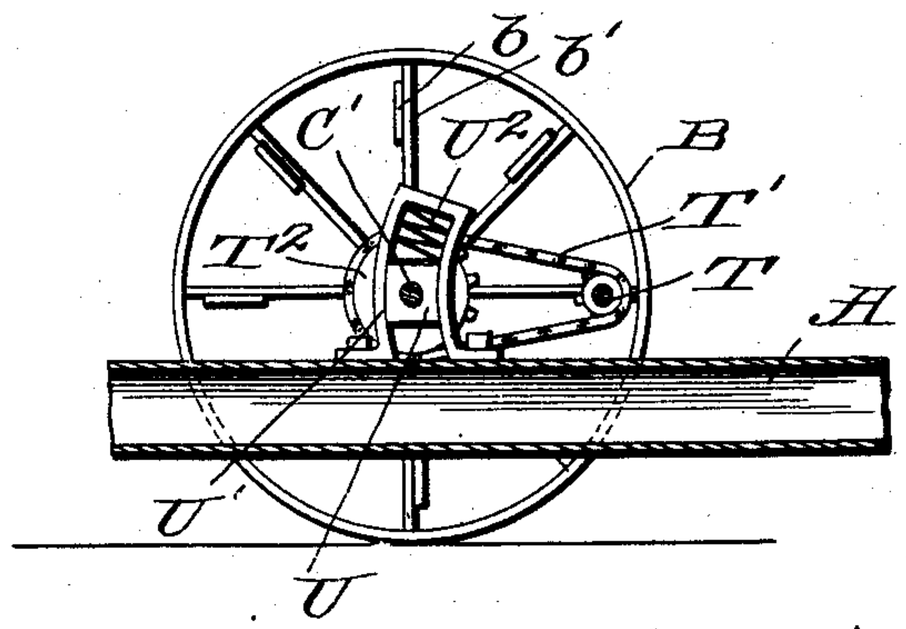


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN A. HOWELL, OF THE UNITED STATES NAVY.

COMBINED BEACH-WAGON AND SURF-BOAT.

992,775. Specification of Letters Patent. Patented May 23, 1911.

Application filed December 8, 1908. Serial No. 466,534.

To all whom it may concern:

Be it known that I, JOHN A. HOWELL, rear admiral, United States Navy, residing at Atlantic City, in the county of Atlantic and State of New Jersey, have invented certain new and useful Improvements in Combined Beach-Wagons and Surf-Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements in combined beach-wagons and surf-boats, and is intended more especially to provide certain improvements in my patent for combined beach-wagon and surf-boat, granted June 19, 1900, No. 652,184.

Beach roads for vehicles are only very good when of sand and washed by waves. The ocean sides of the sand islands along the Atlantic seaboard have excellent beach roads. The land sides, also of sand, present no features of a road, and an amphibious vehicle has no place there. For the Atlantic coast then, and similar coasts elsewhere, an amphibious vehicle to justify the name must be fitted to pass the surf and navigate the open sea. Any boat in rough water, to be safe, must have stability and be closed against entrance of water. The amphibious boat, besides being safe, at sea, must have only moderate weight to carry on the road wheels. It must also be strong enough to stand striking the beach.

My solution of the problem is to tie two floats to each other by a strong girder in the direction of intended movement in water or on land, thereby obtaining the necessary displacement, strength and longitudinal stability with a minimum of weight, and wetted surface. By following ordinary boat construction we might get stability and displacement, within weight limits, but the strength would be lacking, also steering qualities, and the resulting surplus buoyancy would be so placed as to increase pitching moments and make the propeller and rudder useless in rough water. Again, my plan is adapted to excluding all water while passing through breakers, through which the boat would drift if engine gave out, being noncapsizable. It also simplifies the propulsion, by turning a road wheel into an efficient paddle wheel, and by placing a screw where it will continue immersed. It also makes steering certain and reliable, and eliminates the man at the steering oar, who has heretofore always been necessary in surf boats. It utilizes the weight of fuel by making it contribute to the longitudinal and transverse stability, in a place perfectly safe from fire. All these manifest improvements, over the usual boat, are obtainable without sacrifice of any essential quality of a life boat, save, possibly, a little speed in smooth water, which is more than counterbalanced by increased speed in rough water, and the high land speed of an automobile. The two floats are related to each other in this way. The action of the waves on either cannot lift the other out of water, so that steering never fails, and the screw cannot be pitched out of water. The one float carrying passengers is so constructed that pitching moments are reduced to a minimum by concentrating the surplus buoyancy at the middle of the float. The rear float, if rigid to the forward one, may have a rudder and pivoted wheel operated in the usual manner, but I prefer to steer by swinging the floats in reference to each other, (the girder being pivoted), for when trail is hard over, a capsize is impossible. Under these general conditions, vehicles may consist of two floats, each complete in itself in all particulars and fitted to carry passengers, connected lengthwise (in the direction of motion), so as to get necessary longitudinal stability; or of a passenger float and a smaller one, only intended for longitudinal stability and steering, or any variation between these two limits. On land the vehicle is supported on wheels, ordinarily two under the main float, and one under the trail, or more if necessary, and steering is effected by slewing the floats or the pivoted wheel.

To increase the sea speed and simplify machinery, and increase steering power, the land wheels are used as sea propellers, being lifted to proper position, by causing the float to lift in the water, by adjusting

the girder between floats, since by holding the bottom of forward float inclined upward to the direction of motion, the float must rise, and with sufficient power would skim along the surface of the water. Or the proper immersion of the paddle wheel can be effected by either lifting the wheel, or by designing the float so it will trim with bow lifted in the water.

My invention will be more fully understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 is a side elevation, and Fig. 2 a plan view of the complete device. Figs. 3 and 4 show in side elevation and plan a modified form of steering arrangement, and Fig. 5 is a section near the bow of the boat, and shows means for cushioning the front wheels, and lifting them to regulate immersion of paddles.

A represents the hull of the boat proper, which is decked over as at A′, and provided with a cock-pit A^2 closed by any suitable removable cover or hood A^3. Bull's-eyes *a* for lighting the cock-pit when the cover is on are provided, and any suitable ventilating device, (not shown) may be used for ventilating the same when the cover is on.

The forward end of the hull A is supported when on land on the wheels B, which carry buckets *b* adapted to engage the water when the boat is afloat. These wheels B may be mounted upon a single shaft and turn together, but for convenience of management of the boat, the two wheels B are preferably mounted on separate shafts C and C′, which may be thrown into and out of engagement with the drive shaft D by suitable clutch mechanism F and F′. The shaft D is driven by suitable gearing driven by the internal combustion engine E. This engine E also drives the propeller G, whose shaft may be thrown into or out of engagement by means of suitable clutch mechanism G′.

Referring to the form of device shown in Figs. 1 and 2, the rear float K, which is preferably made double ended, boat shaped, as at *k*′, is provided with gasolene tanks *k*° to carry the fuel supply. This fuel supply is thus carried at a distance from the engine, lessening danger of fire, and also utilizing the weight of the fuel to steady the boat. The liquid fuel is supplied to the engine E from the tank R′, fed through the flexible pipe or hose R, under pressure of air supplied in the tank by the air hose or pipe Q, and air pump Q′.

The rear float K, when on land, is supported on the wheel H, whose axle H′ may be adjusted in height by means of the holes *h*°.

When the boat is on land the wheels and floats would assume the position shown in Fig. 1, but when in the water the rear float would dip down to correspond to the broken line marked "Water line", thus immersing the screw G and also the lower buckets *b* on the forward wheels B.

In order to steer the device, whether on land or afloat, the front wheels may be independently operated, and in addition the rear float may be swung laterally about a pivot as shown in Figs. 1 and 2, or the trail wheel and rear float may be slewed, as shown in Figs. 3 and 4.

Referring first to Figs. 1 and 2, the samson post N is rigidly secured to the stern of the forward float, and braced as at N′. The bars L and M form with rear float a swinging frame or girder pivoted to the samson post, and swung laterally by the tiller ropes O and steering wheel P (see Fig. 2). The head of the bar M may be provided with a plurality of holes *m* to adjust the vertical angle at which the rear float is hinged to the front float, the samson post N should preferably be vertical so as to avoid rolling the boat if the trail be swung laterally. Thus it will be noted in the construction shown in Figs. 1 and 2, the boat may be steered, either on land or afloat, by swinging the rear float laterally by means of the steering wheel and tiller ropes; or by varying the relative speed of the front wheels; or throwing one or the other front wheel out of action by means of the clutch mechanisms F and F′.

In the form of device shown in Figs. 3 and 4, the wheel H is journaled in a yoke k^3 forming part of the rear float. Various holes k^2 may be provided in this yoke for the vertical adjustment of the axle of the trail wheel, so as to mash the same in the rear trail when traveling through the water, and reduce the drag, if desired. Rigidly attached to this yoke is a pivot bar or rudder-head H°, journaled in the framing S, S′, rigidly attached to the front float. This pivot bar or rudder head H° carries a cross-bar or tiller H^2, which may be swung by the tiller ropes O′, and steering-wheel, such as P in Fig. 1. Thus it will be seen that with the form of device shown in Figs. 3 and 4, the rear float and trail wheel may be slewed in the girder S—S′, which is rigidly fastened to the forward float, instead of swinging about samson post, and thereby steer the combination either on land or in the water.

It will be obvious that the clutch arrangement shown in Figs. 1 and 2, for driving

independently of each other, the two front wheels, may also be adopted in connection with the device shown in Figs. 3 and 4.

To give a cushioning effect to the front wheels to compensate for the weight of the front float with its load of passengers, any suitable pneumatic tire or spring attachment may be provided, such, for instance, as is shown in Fig. 5, in which the journal blocks U of the axle C′ travel in curved guides U′ and engage a heavy spring U^2. The shaft C′ is driven by a sprocket wheel T^2, chain T′, and pinion T from the engine. Evidently, this motion of wheels and axle about the counter shaft will also permit adjustment of the immersion of the paddle wheels.

It will be seen that the main weights are concentrated near the center of the system; that the propeller will be unclutched when on land, but immersed when afloat, and that the land tread of the front wheels will protect the buckets on the spokes of said wheels.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:

1. A device of the character described, comprising two floats connected to each other in the direction of motion, means operable from the front float for swinging the rear float with a propeller mounted between said floats, substantially as described.

2. A device of the character described, comprising two floats connected to each other in the direction of motion, and means for swinging the rear float in the horizontal plane, with a propeller mounted between said floats, substantially as described.

3. A device of the character described, comprising two floats pivotally connected to each other in the direction of motion, side wheels for the first float, and a trail wheel for the second float, and a propeller mounted between said floats, substantially as described.

4. A device of the character described, comprising two floats pivotally connected to each other in the direction of motion, side wheels for the first float, and a trail wheel for the second float, means for swinging the rear float in the horizontal plane, and a propeller mounted between said floats, substantially as described.

5. A device of the character described, comprising two floats connected to each other in the direction of motion, road wheels with buckets on the spokes mounted beneath the first float, a trail wheel carried by the second float and serving as a drogue at sea and a guide wheel on shore, means operable from the front float for swinging the rear float and a propeller mounted between said floats, substantially as described.

6. A device of the character described, comprising two floats connected to each other in the direction of motion, road wheels with buckets on the spokes mounted beneath the first float, a trail wheel carried by the second float and serving as a drogue at sea and a guide wheel on shore, means operable from the front float for swinging the rear float, a propeller mounted between said floats, and an engine and gearing for driving the road wheels for the first float, and also the propeller, substantially as described.

7. A device of the character described, comprising two floats connected to each other in the direction of motion, road wheels with buckets on the spokes mounted beneath the first float, a trail wheel carried by the second float, a propeller mounted between said floats, and an engine and gearing for driving the road wheels for the first float, and also the propeller, with clutch mechanism independently operable, for throwing said road wheels and said propeller out of gear with said engine, substantially as described.

8. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, means for adjusting the vertical angle between the second float and the first, and means for swinging the rear float in the horizontal plane, with a propeller mounted between said floats, substantially as described.

9. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, side wheels for the first float, and a trail wheel for the second float, means for adjusting the vertical angle between the second float and the first, means for swinging the rear float in the horizontal plane, and a propeller mounted between said floats, substantially as described.

10. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, road wheels with buckets on the spokes mounted beneath the first float, a trail wheel carried by the second float and serving as a drogue at sea and a guide wheel on shore, means operable from the front float for swinging the rear float and a propeller mounted between said floats, substantially as described.

11. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, road wheels with buckets on the spokes mounted beneath the first float, a

trail wheel carried by the second float, means for swinging said second float through an angle laterally, and a propeller mounted between said floats, substantially as described.

12. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, side wheels for the first float, and a trial wheel for the second float, means for varying the adjustment vertically of said trial wheel, and a propeller mounted between said floats, substantially as described.

13. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, side wheels for the first float, and a trail wheel for the second float, means for varying the adjustment vertically of said trail wheel, means for swinging the rear float in the horizontal plane, and a propeller mounted between said floats, substantially as described.

14. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, road wheels with buckets on the spokes mounted beneath the first float, a trail wheel carried by the second float, and means for varying the adjustment vertically of said trail wheel, substantially as described.

15. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, the front float having decked over bow and stern, with a covered elevated cock-pit near the center, and means for swinging the rear float in the horizontal plane, with a propeller mounted between said floats, substantially as described.

16. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, the front float having decked over bow and stern, with a covered elevated cockpit near the center, side wheels for the first float, a trail wheel for the second float, means for swinging said second float through an angle laterally, and a propeller mounted between said floats, substantially as described.

17. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, the front float having decked over bow and stern, with a covered elevated cockpit near the center, side wheels, carrying buckets, for the first float, and a trail wheel for the second float, and means for swinging the rear float in the horizontal plane, substantially as described.

18. A device of the character described, comprising two floats normally held relative to each other in the longitudinal vertical plane, the front float having decked over bow and stern, with a covered elevated cockpit near the center, road wheels with buckets on the spokes mounted beneath the first float, a trail wheel carried by the second float, and means for swinging said second float through an angle laterally, substantially as described.

19. A device of the character described, comprising two boat shaped floats normally held relative to each other in the longitudinal vertical plane, the front float carrying an engine, and the rear float carrying liquid fuel therefor, a compressed air system for pumping the fuel from the rear float to the engine, means for swinging the rear float in the horizontal plane, with a propeller mounted between said floats, substantially as described.

20. A device of the character described, comprising two boat shaped floats normally held relative to each other in the longitudinal vertical plane, the front float carrying an engine, and the rear float carrying liquid fuel therefor, a compressed air system for pumping the fuel from the rear float to the engine, side wheels with buckets for the first float, and a trail wheel for the second float, substantially as described.

21. A device of the character described, comprising two boat shaped floats normally held relative to each other in the longitudinal vertical plane, the front float carrying an engine, and the rear float carrying liquid fuel therefor, a compressed air system for pumping the fuel from the rear float to the engine, side wheels with buckets for the first float, and a trail wheel for the second float, means for swinging the rear float in the horizontal plane, and a propeller mounted between said floats, substantially as described.

22. A device of the character described, comprising two boat shaped floats normally held relative to each other in the longitudinal vertical plane, the front float carrying an engine, and the rear float carrying liquid fuel therefor, a compressed air system for pumping the fuel from the rear float to the engine, road wheels with buckets on the spokes mounted beneath the first float, and a trail wheel carried by the second float, with means for swinging said second float through an angle laterally, substantially as described.

23. A device of the character described, comprising two floats pivotally connected to each other in the direction of motion, side wheels for the first float, yielding bearings for the axles fo said wheels, and a trial

wheel for the second float, and a propeller mounted between said floats, substantially as described.

24. A device of the character described, comprising two floats pivotally connected to each other in the direction of motion, side wheels for the first float, yielding bearings for the axles of said wheels, and a trail wheel for the second float, means for swinging the rear float in the horizontal plane, and a propeller mounted between said floats, substantially as described.

25. A device of the character described, comprising two floats connected to each other in the direction of motion, road wheels with buckets on the spokes mounted beneath the first float, spring bearings for said wheels, a trail wheel carried by the second float, and a propeller mounted between said floats, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHN A. HOWELL.

Witnesses:
GEORGE W. STONE,
MARY PARSELS.